

TS 135 → TS 1235  
THYRISTORS

T-25-17

General purpose SCR suited for power supplies up to 400 Hz on resistive or inductive loads.

- $V_{RRM}$  up to 1 200 V.
- Glass passivated chips.
- High stability and reliability.

Thyristors à usage général, pour des alimentations jusqu'à 400 Hz sur charges résistives ou inductives.

- $V_{RRM}$  jusqu'à 1 200 V.
- Pastilles glassivées.
- Grande stabilité des caractéristiques.

$$I_T(RMS) = 35 \text{ A} / T_{case} = 75^\circ\text{C}$$

$$100 \text{ V} \leq \frac{V_{DRM}}{V_{RRM}} \leq 1200 \text{ V}$$

Case : TO 48 metal (CB-267)  
Boîtier



ABSOLUTE RATINGS (LIMITING VALUES) VALEURS LIMITES ABSOLUES D'UTILISATION	Symbol	Value	Unit
RMS on-state current* Courant efficace à l'état passant*	$I_T(RMS)$	35 @ $T_{case} = 75^\circ\text{C}$	A
Mean on-state current* Courant moyen à l'état passant*	$I_T(AV)$	22,5 @ $T_{case} = 75^\circ\text{C}$	A
Non repetitive surge peak on-state current** Courant non répétitif de surcharge crête accidentelle à l'état passant**	$I_{TSM}$ $I_{TSM}$	360 (t = 8,3 ms) 330 (t = 10 ms) @ $T_j \leq 125^\circ\text{C}$	A A
$i^2 t$ for fusing Valeur de la constante $i^2 t$	$i^2 t$	545 (t = 10 ms) @ $T_j \leq 125^\circ\text{C}$	A <sup>2</sup> s
Critical rate of rise of on-state current*** Vitesse critique de croissance du courant à l'état passant***	$di/dt$	100	A/ $\mu$ s
Storage and operating junction temperatures Températures extrêmes de stockage et de jonction en fonctionnement	$T_{stg}$ $T_j$	-40 , + 150 -40 , + 125	$^\circ\text{C}$ $^\circ\text{C}$

@ $T_j = 125^\circ\text{C}$	TS 135	TS 235	TS 435	TS 635	TS 835	TS 1035	TS 1235
$V_{DRM} = V_{RRM}$ (V)	100	200	400	600	800	1000	1200

Thermal resistances Résistances thermiques	Symbol	Value	Unit
— Junction to case for D.C. Jonction-boîtier en continu	$R_{th(j-c)}$	1,1	$^\circ\text{C}/\text{W}$
— Contact (case to heatsink) Contact (boîtier-radiateur)	$R_{th(c-h)}$	0,4	$^\circ\text{C}/\text{W}$

\* Single phase circuit, 180° conduction angle  
\* Circuit monophasé, angle de conduction 180°

\*\* Half sine wave  
\*\* Demi-onde sinusoïdale

\*\*\* Gate supply 20 V/20  $\Omega$  -  $t_r \leq 0,1 \mu\text{s}$  - Half sine wave of 6,3  $\mu\text{s}$   
\*\*\* Générateur de gâchette Demi-sinusoïde

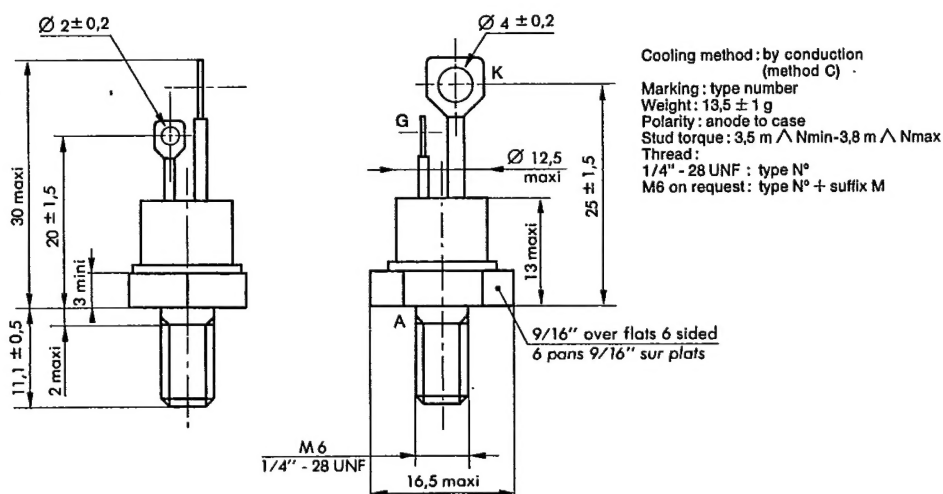
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**GATE CHARACTERISTICS (Maximum values)**  
**CARACTÉRISTIQUES DE GACHETTE (Valeurs maximales)**
 $P_{GM} = 60 \text{ W}$  ( $t = 500 \mu\text{s}$ )  
 $P_{G(AV)} = 1 \text{ W}$ 
 $I_{FGM} = 10 \text{ A}$  ( $t = 500 \mu\text{s}$ )  
 $V_{FGM} = 15 \text{ V}$  ( $t = 500 \mu\text{s}$ )
 $V_{RGM} = 5 \text{ V}$ 
**ELECTRICAL CHARACTERISTICS**  
**CARACTÉRISTIQUES ÉLECTRIQUES**

Symbol	Value			Unit	Test conditions			
	min	typ	max					
$I_{GT}$			80	mA	$T_J = 25^\circ\text{C}$	$V_D = 12 \text{ V}$	$R_L = 33 \Omega$	$t_p \geq 20 \mu\text{s}$
$V_{GT}$			3	V	$T_J = 25^\circ\text{C}$	$V_D = 12 \text{ V}$	$R_L = 33 \Omega$	$t_p \geq 20 \mu\text{s}$
$V_{GD}$	0,2			V	$T_J = 125^\circ\text{C}$	$V_D = V_{DRM}$	$R_L = 3,3 \text{ k}\Omega$	
$I_H$		20		mA	$T_J = 25^\circ\text{C}$	$I_T = 0,5 \text{ A}$	Gate open	
$V_{TM}$			2,2	V	$T_J = 25^\circ\text{C}$	$I_{TM} = 70 \text{ A}$	$t_p = 10 \text{ ms}$	
$I_{DRM}$			3,3	mA	$T_J = 125^\circ\text{C}$	$V_{DRM}$ specified		
$I_{RRM}$			3,3	mA	$T_J = 125^\circ\text{C}$	$V_{RRM}$ specified		
$t_{gt}$		2		$\mu\text{s}$	$T_J = 25^\circ\text{C}$ $I_G = 200 \text{ mA}$	$I_T = 70 \text{ A}$ $di_G/dt = 2 \text{ A}/\mu\text{s}$	$V_D = V_{DRM}$	
$t_q$		100		$\mu\text{s}$	$T_J = 125^\circ\text{C}$ $di_R/dt = 30 \text{ A}/\mu\text{s}$	$I_T = 10 \text{ A}$ $dv/dt = 20 \text{ V}/\mu\text{s}$	$V_R = 30 \text{ V}$ $V_D = 0,67 V_{DRM}$ Gate open	
$dv/dt^*$	100			V/ $\mu\text{s}$	$T_J = 125^\circ\text{C}$	Linear slope up to 0,67 $V_{DRM}$ specified		

\* For higher guaranteed values, please consult us.

**CASE DESCRIPTION**  
**DESCRIPTION DU BOITIER**


TO 48 metal (CB-267)

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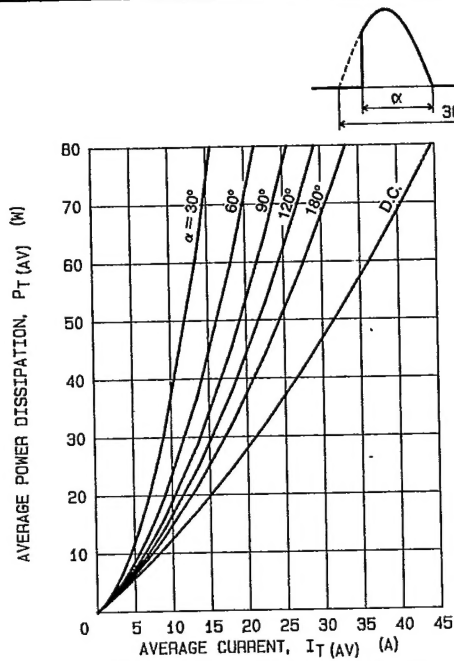


FIG.1 - MAXIMUM ON-STATE POWER DISSIPATION FOR SINUSOIDAL CURRENT WAVEFORM

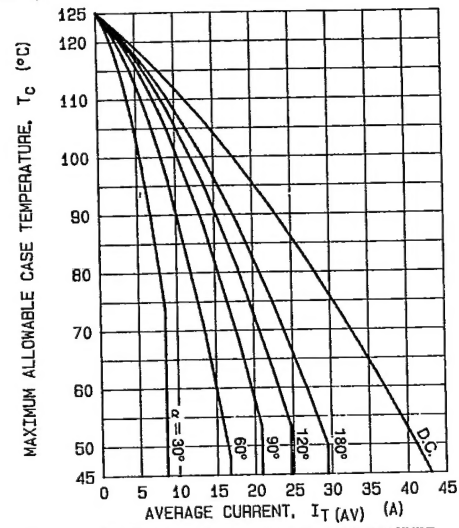


FIG.2 - MAXIMUM ALLOWABLE CASE TEMPERATURE FOR SINUSOIDAL CURRENT WAVEFORM

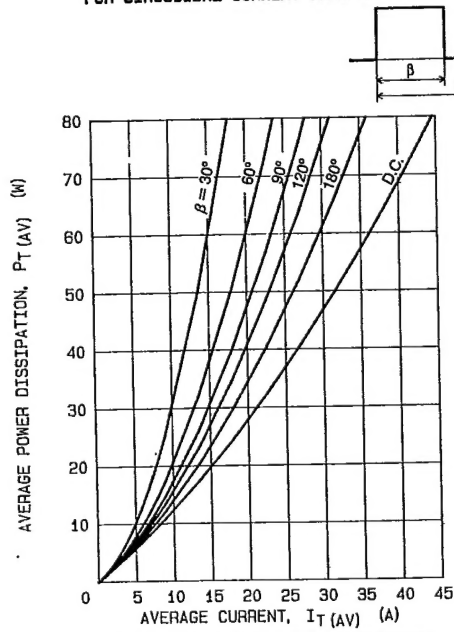


FIG.3 - MAXIMUM ON-STATE POWER DISSIPATION FOR RECTANGULAR CURRENT WAVEFORM

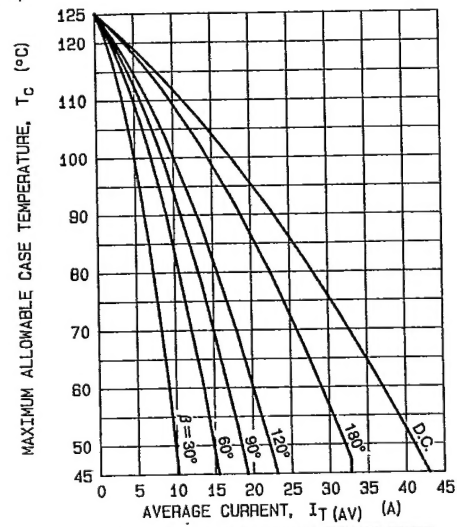


FIG.4 - MAXIMUM ALLOWABLE CASE TEMPERATURE FOR RECTANGULAR CURRENT WAVEFORM

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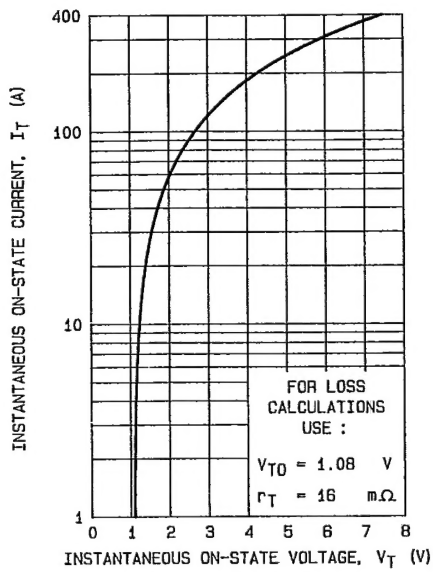
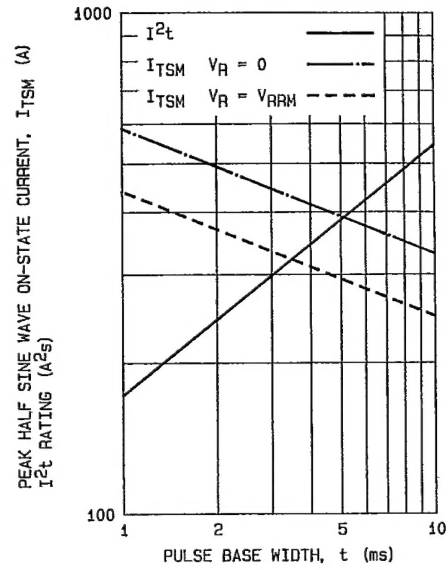
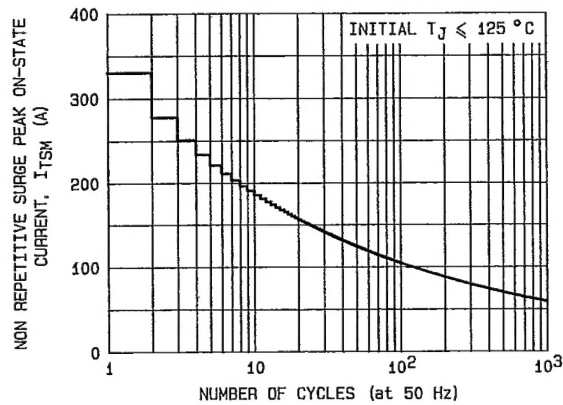
FIG. 5 - MAXIMUM ON-STATE CONDUCTION CHARACTERISTIC ( $T_J = 125^\circ\text{C}$ ).FIG. 6 - NON REPETITIVE SUB-CYCLE SURGE ON-STATE CURRENT AND  $I^2t$  RATING (INITIAL  $T_J = 125^\circ\text{C}$ ).

FIG. 7 - NON REPETITIVE SURGE PEAK ON-STATE CURRENT VERSUS NUMBER OF CYCLES.

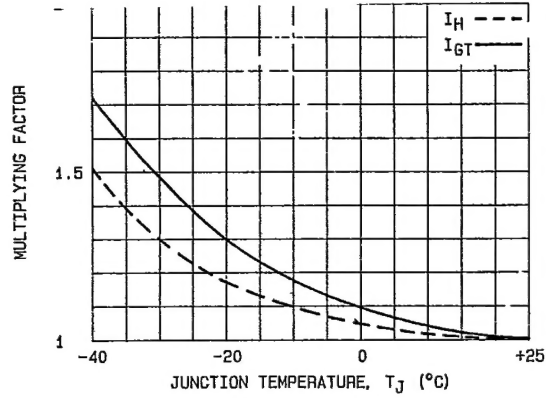


FIG.8 - RELATIVE VARIATION OF GATE TRIGGER CURRENT AND HOLDING CURRENT VERSUS JUNCTION TEMPERATURE.

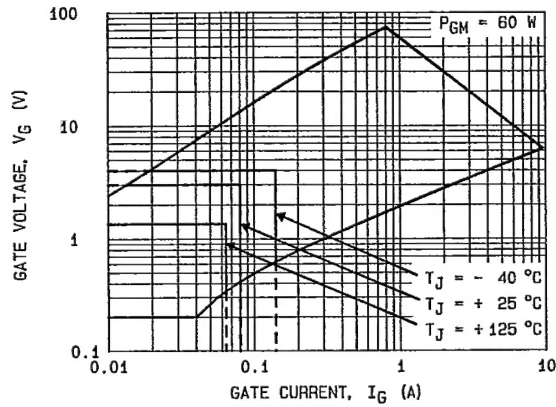
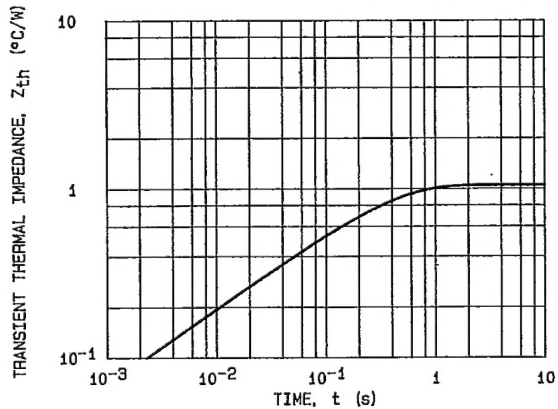


FIG.9 - GATE TRIGGER CHARACTERISTICS.



Conduction angle ( $\alpha, \beta$ )	Effective thermal resistance ( $^{\circ}\text{C/W}$ ) junction to case	
	Sinusoidal	Rectangular
180 $^{\circ}$	1.13	1.17
120 $^{\circ}$	1.23	1.65
90 $^{\circ}$	1.32	1.87
60 $^{\circ}$	1.54	2.08
30 $^{\circ}$	1.98	2.64

FIG.10 - TRANSIENT THERMAL IMPEDANCE JUNCTION TO CASE.